PATENT APPLICATION TRANSMITTAL LETTER
(Large Entity)

Docket No.
INTL-0075-US (P6261)

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Transmitted herewith for filing under 35 U.S.C. 111 and 37 C.F.R. 1.53 is the patent application of:

James P. Ketrenos

For:

MAINTAINING ACCESS TO A VIDEO STACK AFTER AN APPLICATION CRASH

Enclosed are:

- ☒ Certificate of Mailing with Express Mail Mailing Label No. EL155807117US
- ☒ 2 sheets of drawings.
- ☐ A certified copy of a application.
- ☒ Declaration ☒ Signed. ☐ Unsigned.
- ☒ Power of Attorney
- ☐ Information Disclosure Statement
- ☐ Preliminary Amendment
- ☒ Other: Assignment Papers (Cover Sheet & Document(s))

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra		Rate	Fee
Total Claims	25	- 20 =	5	x	$22.00	$110.00
Indep. Claims	5	- 3 =	2	x	$82.00	$164.00
Multiple Dependent Claims (check if applicable) ☐						$0.00
					BASIC FEE	$790.00
					TOTAL FILING FEE	$1,064.00

- ☒ A check in the amount of $1,064.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 20-1504 as described below. A duplicate copy of this sheet is enclosed.
  - ☐ Charge the amount of as filing fee.
  - ☒ Credit any overpayment.
  - ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
  - ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated: 9/15/98

Signature

Timothy N. Trop, Reg. No. 28,994
Trop, Pruner, Hu & Miles, P.C.
8550 Katy Freeway, Suite 128
Houston, TX 77024
(713) 468-8880
(713) 468-8883 FAX

cc:

INTL-0075 (P6261)

APPLICATION

FOR

UNITED STATES LETTERS PATENT

TITLE: MAINTAINING ACCESS TO A VIDEO STACK AFTER AN APPLICATION CRASH

INVENTORS: JAMES P. KETRENOS

Express Mail No.: EL155807117US
Date Mailed: September 15, 1998

MAINTAINING ACCESS TO A VIDEO STACK AFTER AN APPLICATION CRASH

BACKGROUND

This invention relates generally to systems that use video streams and particularly to techniques for maintaining access to those video streams even after an application using the video stream crashes.

Computer systems are often used to provide a television program on a television or monitor connected to the computer which may include a television tuner card. The combination of television and computer offers many advantages. The computer may provide software which facilitates selection of television programs, for example, using electronic program guides. In addition, the television may receive interactive broadcasts which include television programs with accompanying web content. The web content, which may be related to the television program, may provide additional information while allowing the user to respond to inquiries made during the television broadcast. In addition, links may be provided to enable the viewer to link to Internet web sites related to the broadcaster or the broadcast itself.

When an application program calls for television programming, the application program accesses a video stack, a software layer for handling video, which provides a video stream for the application. If the application crashes in the course of the video stream, the video stream may not be properly shut down. As a result, the video stack may not be accessible by another application which has not crashed.

For a subsequent application to access the television video after a crash, it is normally necessary to reboot the computer system to reset the video stack to enable subsequent applications to access that stack. This is awkward for many computer users since the computer user may have other processes ongoing on his or her computer system which then must be interrupted to reboot the computer.

Thus, there is a need for a television video stream system which allows access to the video stack, without rebooting, after an application using the video stack has crashed.

SUMMARY

In accordance with one embodiment, a method for accessing a video stream includes initializing the video stream using a video server when a first application requests video. If the first application crashes, access to the video stream is maintained for a second application through the video server.

DESCRIPTION OF THE DRAWING

Figure 1 is a schematic depiction of the interaction of a pair of applications with a video server and a video stack in accordance with one embodiment of the present invention;

Figure 2 is a flow chart showing the operation of the system shown in Figure 1; and

Figure 3 is a block depiction of a computer implementing one embodiment of the present invention.

DETAILED DESCRIPTION

An application can access television video through a video server operating through a separate video window at a memory address space distinct from the memory address space of the video window used by the application itself, as indicated in Figure 1. The video server could be a television video server or a digital video disk (DVD) server as examples. The application "A", indicated by the block 10, sets up a parent video window 14. The parent video window 14 is passed to a video server 18 which then creates a child window 19 of the parent window 14. In effect, then the parent window provides the handle to the child window which provides the handle to the video stack.

The server 18 then places the video in the child window 19. The child window 19 handles the communication between the server 18 and the video stack 20. The video stack 20 may, for example, be Video for Windows or DirectShow, both from Microsoft Corporation. Since the window 14 and the window 19 operate from separate and different address spaces in a computer's memory, if the application A crashes, as indicated in dashed lines in Figure 1, the window 19 in the TV server 18 may be maintained.

In prior systems, when the application A crashed, the window 14, which provided video services, crashed as well, leaving the video stack 20 in an unusable state. Thereafter, when a separate application, such as the application B in block 12, attempted to access video services, it was unable to do so without rebooting the computer.

In the embodiment shown in Figure 1, the application 12 may set up its own parent window 14 which then handles the

video window 19 in the TV server 18. The application B has immediate access the video stack through the server 18 despite the fact that the application A may have crashed and may no longer be operating. The settings on the server 18 and its video window 19 may continue to be maintained unaffected by the crash of the application A.

Referring now to Figure 2, a software program for implementing an embodiment of the system described with respect to Figure 1, begins at 28. An application, such as the application A, connects to a TV server 18, as indicated in block 30. The application requests video (block 32) and an inquiry is made to determine whether video is initialized, as indicated in diamond 34. If so, the video is deinitialized. This restores the video to a known, stable state. If not, the TV server initializes the video using the window provided by the application as the parent window (block 38). The application uses the video for such purposes as desired, as indicated in block 40.

At diamond 42, an inquiry is made to determine whether the application has crashed. The crash detection may be implemented, for example, by monitoring exception handler codes. The software may tie into the operating system and wait for a pre-set exception handler code indicative of a crash. When a particular code is detected, the software determines that a crash is occurring in the application program. In block 48, the video stack is automatically shut down and in block 50 the TV tuner card is also automatically shut down upon detection of a crash.

If no crash is detected, the application eventually requests the TV server to close video when the application

is done with the video, as indicated in block 44. As long as the operating system is operating correctly, the application leaves the video initialized, as indicated in block 46.

In the case of a crash, by shutting down the video stack and the TV tuner card quickly upon detecting the error condition, the video stack may be maintained in a usable state for a subsequent application, such as the application B illustrated in Figure 1. Even though the parent video window 14 may be unusable, the TV server 18 is still running correctly and is able to access the video stack 20 because the server's parent window 19 is operating in a separate address space from the application's window 14.

Video is activated in the windows using handles supplied by the server 18. If there is a crash, the parent window 14 disappears, but the video stack is still connected to the TV server window 19. When a new application starts, it requests video from the TV server 18 and the TV server, unaffected by the crash of the prior application, can then provide a connection to the video stack.

Referring now to Figure 3, an exemplary computer system 51 for implementing an embodiment of the present invention, includes a processor 52 connected to a bridge 54. The bridge 54 is in turn connected to system memory 56. System memory 56 includes a plurality of address spaces including the address spaces 70 and 72. One of the address spaces 70, 72 may be used for the window 19 and the other may be used for the window 14.

The bridge 54 connects to a conventional bus 58. A tuner card 62 may be connected to the bus 58. A display 64

such as a television may be connected to the tuner card 62. A bridge 60 is also connected to the bus 58. The bridge 60 couples a hard disk drive 66 which may store a plurality of software programs including the software to implement the server 18 and video stack 20 as well as an application program 68, which could correspond to the application A or the application B in Figure 1.

While the present invention has been described with respect to a limited number of embodiments, those skilled in the art will appreciate numerous modifications and variations therefrom. It is intended that the present application cover all such modifications and variations that fall within the true spirit and scope of the present invention.

What is claimed is:

1. A method for accessing a video stream comprising:

when a first application requests video, initializing a video stream using a video server; and

if the first application crashes, maintaining access to the video stream for a second application through the video server.

2. The method of claim 1 including detecting when the first application crashes.

3. The method of claim 2 wherein detecting when the first application crashes includes detecting when the first application crashes by monitoring an exception handler.

4. The method of claim 1 including shutting down the video stack when a crash is detected.

5. The method of claim 1 including shutting down a television capture card when a crash is detected.

6. The method of claim 1, wherein maintaining access to the video stream includes operating said video stream in a separate address space from the first application.

7. The method of claim 1 wherein when a crash is detected, directing the server to release the video stack.

8. The method of claim 1, wherein maintaining access to the video stream includes using software in the second application for accessing said server and software in said server for accessing the video stack.

9. A method for accessing a television video stream comprising:

connecting an application needing video services to a television server using a window which operates in a separate address space from the application;

monitoring to determine if the application crashes while receiving the video stream; and

when the application crashes, automatically shutting down a video stack and a video capture card.

10. The method of claim 9 including detecting when the application crashes by monitoring an exception handler.

11. The method of claim 9 wherein when a crash is detected, directing the television server to release the video stack.

12. The method of claim 9 including operating a first window in the application for accessing the

television server and a second window in said server for accessing the video stack.

13. An article comprising a medium for storing instructions for causing a computer to:

when a first application requests video, initialize a video stream using a video server; and

if the first application crashes, maintain access to the video stream for a second application through the video server.

14. The article of claim 13 including instructions for causing the computer to detect when the first application crashes.

15. The article of claim 14 further including instructions for causing the computer to detect when the first application crashes by monitoring an exception handler.

16. The article of claim 13 including instructions for causing the computer to shut down a video stack when a crash is detected.

17. The article of claim 13 including instructions for causing the computer to shut down a television capture card when a crash is detected.

18. The article of claim 13 including instructions for causing the computer to operate said

video stream in a separate address space from the application.

19. The article of claim 13 including instructions for causing the computer to direct the television server to release a video stack when a crash is detected.

20. The article of claim 13 including instructions for causing the computer to operate a first window in the application for accessing the television server and a second window in said server for accessing a video stack.

21. An article comprising a medium for storing instructions for causing a computer to:

connect an application needing video services to a television server using a window which operated in a separate address space from the application;

monitor to determine if the application crashes while receiving a video stream; and

when the application crashes, automatically shut down a video stack and a video capture card.

22. The article of claim 21 including instructions for causing the computer to detect when the application crashes by monitoring an exception handler.

23. The article of claim 21 including instructions for causing the computer to direct the television server to release the video stack when a crash is detected.

24. The article of claim 21 including instructions for causing the computer to operate a first window in the application for accessing the server and a second window in said server for accessing the video stream.

25. A computer system comprising:

a processor;

a television tuner card coupled to a processor;

a memory coupled to said processor storing programs which cause a computer to:

connect an application needing video service to a television server using a window which operates in a separate address space from the application;

monitor to determine if the application crashes while receiving the video stream; and

when the application crashes, automatically shut down a video stack and the video capture card.

MAINTAINING ACCESS TO A VIDEO STACK
AFTER AN APPLICATION CRASH

ABSTRACT OF DISCLOSURE

An application may connect to a video stack through a separate server which uses a window in a separate address space from the video window used by the application to seek video services. If the application crashes, sufficient time will be available to allow the television capture card and the video stack to be shut down in an orderly fashion and to enable them to be reused by subsequent applications without requiring that the computer be rebooted.

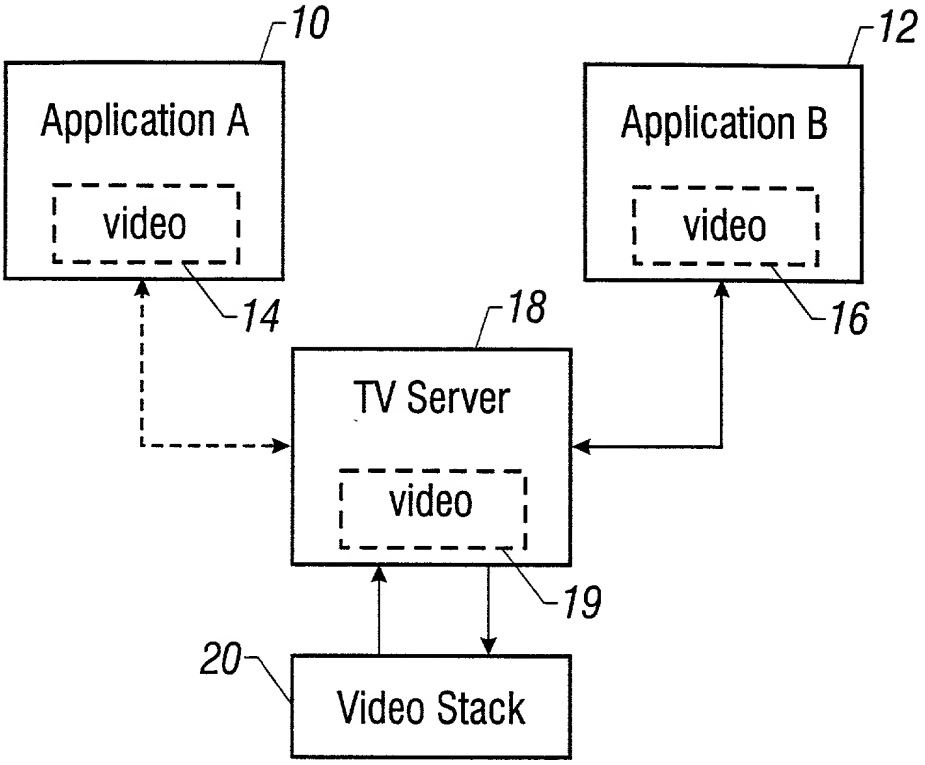
10
Application A
video
12
Application B
video
14
16
18
TV Server
video
19
20
Video Stack

FIG. 1

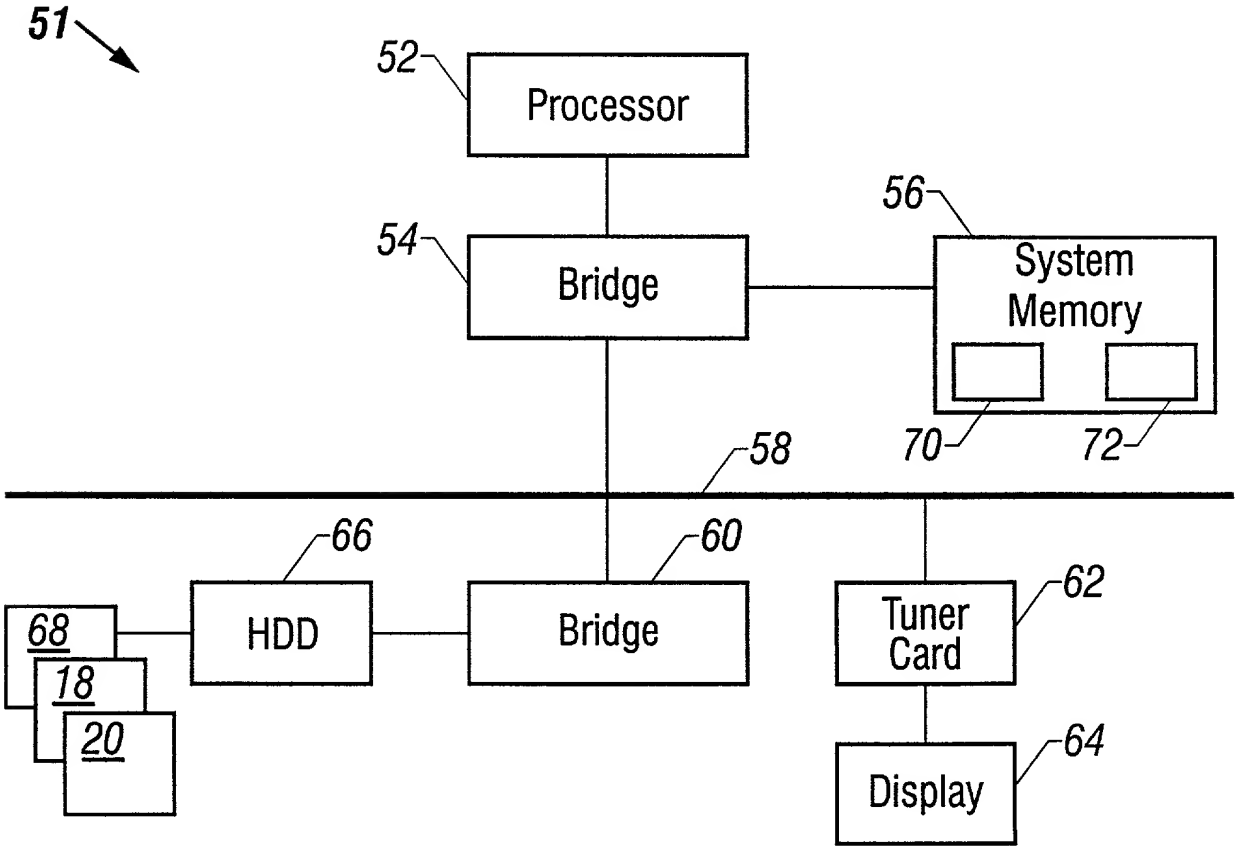
51
52
Processor
54
Bridge
56
System Memory
70
72
58
66
60
62
HDD
Bridge
Tuner Card
68
18
20
64
Display

FIG. 3

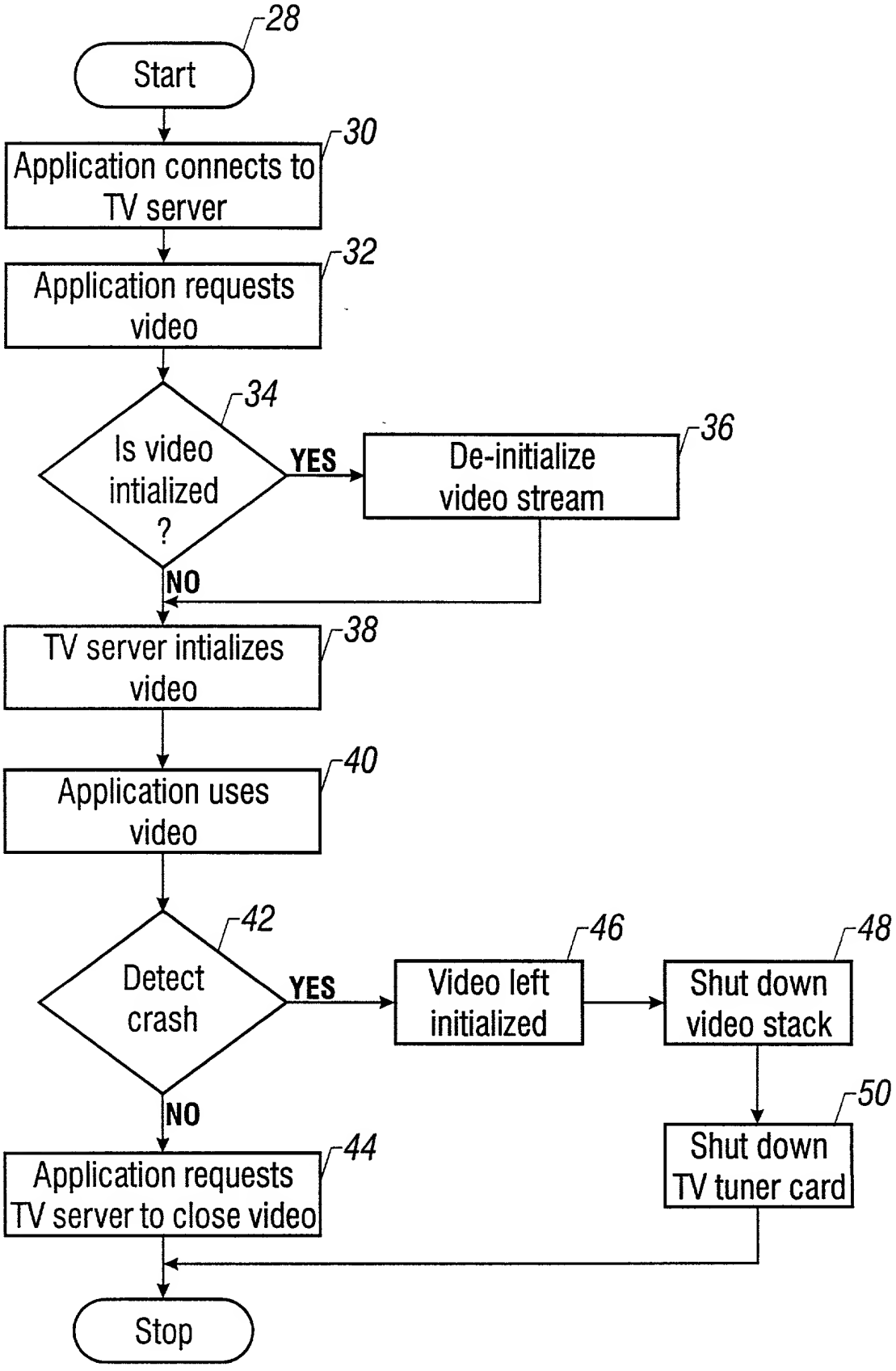
28
Start
30
Application connects to TV server
32
Application requests video
34
Is video intialized ?
YES
36
De-initialize video stream
NO
38
TV server intializes video
40
Application uses video
42
Detect crash
YES
46
Video left initialized
48
Shut down video stack
50
Shut down TV tuner card
NO
44
Application requests TV server to close video
Stop

FIG. 2

Attorney's Docket No.: INTL-0075-US (P6261) PATENT

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

MAINTAINING ACCESS TO A VIDEO STACK AFTER AN APPLICATION CRASH

the specification of which

X	is attached hereto.
	was filed on _____ as
	United States Application Number _____
	or PCT International Application Number _____
	and was amended on _____
	(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above. I do not know and do not believe that the claimed invention was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and that the invention has not been patented or made the subject of an inventor's certificate Issued before the date of this application in any country foreign to the United States of American on an application filed by me or my legal representatives or assigns more than twelve months (for a utility patent application) or six months (for a design patent application) prior to this application.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):			Priority Claimed	
Number	(Country)	(Day/Month/Year Filed)	Yes	No
Number	(Country)	(Day/Month/Year Filed)	Yes	No
Number	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under title 35, United States Code, Section 119(e) of the United States provisional application(s) listed below:

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Number)	Filing Date	(Status-patented, pending, abandoned)
(Application Number)	Filing Date	(Status-patented, pending, abandoned)

I hereby appoint Timothy N. Trop, Reg. No. 28,994; Fred G. Pruner, Jr., Reg. No. 40,779, Dan C. Hu, 40,025; Coe F. Miles, Reg. No. 38,559, my patent attorneys, of TROP, PRUNER, HU & MILES, P.C., with offices located at 8550 Katy Freeway, Ste. 128, Houston, TX 77024, telephone (713) 468-8880, and Joseph R. Bond, Reg. No. 36,458; Richard C. Calderwood, Reg. No. 35,468; Sean Fitzgerald, Reg. No. 32,027; David J. Kaplan, Reg. No. 41,105; Leo V. Novakoski, Reg. No. 37,198; Naomi Obinata, Reg. No. 39,320; Thomas C. Reynolds, Reg. No. 32,488; Steven P. Skabrat, Reg. No. 36,279; Howard A. Skaist, Reg. No. 36,008; Steven C. Stewart, Reg. No. 33,555; Raymond J. Werner, Reg. No. 34,752; and Charles K. Young, Reg. No. 39,425; my patent attorneys, of INTEL CORPORATION; with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

Send correspondence to Timothy N. Trop, TROP, PRUNER, HU & MILES, P.C., 8550 Katy Freeway, Ste. 128, Houston, TX 77024 and direct telephone calls to Timothy N. Trop, (713) 468-8880.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole/First Inventor: **JAMES P. KETRENOS**	
Inventor's Signature:	Date: Sept. 14, 1998
Residence: **7318 SW 152ND, BEAVERTON, OR 97007**	Citizenship: **U.S.**
Post Office Address: **7318 SW 152ND, BEAVERTON, OR 97007**	

INTL-0075-US